

Claims

1. A system for fabricating a slab from a construction material having both unhardened and hardened states, said system comprising:

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a) a form panel unit comprising:

i. a panel member adapted for use as part of a form to retain said construction material when in an unhardened state, said panel member having generally opposed upper and lower surfaces;

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ii. at least one reinforcement unit having at least one reinforcement member mounted above said upper surface of said panel member and interconnected to said panel member;

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b) a pair of spaced structural supporting members adapted for assisting in supporting said slab made with said construction material;

said form panel unit being configured such that said panel member can be positioned between said spaced structural supporting members, such that said unhardened construction material can be retained above upper surface of said panel member to permit hardening of said construction material from said unhardened state to said hardened state, said reinforcement member having a portion being mounted on at least one of said supporting members such that said panel member is at least in part suspended from said at least one supporting member, and wherein said at least one supporting member has an upper portion extending above said upper surface of said panel member so it can be embedded in said construction material.

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2. A system as claimed in claim 1 wherein said reinforcement member is mounted in a position such that said reinforcement member has a portion above said upper surface of said panel member that is spaced apart from said upper surface of said panel member.

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3. A system as claimed in claim 2 wherein said panel member has a pair of opposed, transversely spaced, longitudinally extending side edges, extending between a transversely extending rear edge and a transversely extending front edge and said system comprises a plurality of reinforcement units being generally transversely oriented and longitudinally spaced, and wherein each of said plurality of reinforcement units has a first portion mounted on said at least one supporting members, and a second portion mounted on the other of said pair of supporting members, whereby said panel member can be suspended from said pair of supporting members.

4. A system as claimed in claim 1 wherein said panel member has a side edge and said reinforcement member having an extension portion extending beyond said side edge of said panel member, said extension portion being mounted on said at least one of said supporting members such that said panel member is suspended from said at least one supporting member.

5. A system as claimed in claim 3 wherein each of said plurality of reinforcement units comprises at least one vertical rod secured to said reinforcement member, each said vertical rod also being secured to said panel member.

6. A system as claimed in claim 1 wherein said system further comprises a plurality of generally longitudinally spaced, generally transversely oriented reinforcement units, each of said plurality of reinforcement units having a portion mounted on said at least one supporting members, and a second portion mounted on the other of said pair of supporting members, whereby said panel member can be suspended from said pair of supporting members.

7. A system as claimed in claim 6 wherein said plurality of reinforcement units each comprises a vertical rod secured to a reinforcement member, said vertical rod also being secured to said panel member.

8. A system as claimed in claim 4 wherein said extension portion of said reinforcement member is a first extension portion, and said reinforcement member has

a second end portion opposite to said first end portion, one of said first and second end portions supported on one of one of said pair of supporting members, and the other of said first and second end portions supported on the other of said pair of supporting members, and wherein panel member is suspended from and between said pair of supporting members, and wherein each of said pair of supporting members has an upper portion extending above said upper surface of said panel member so as to be embedded in said construction material when said construction material is in said hardened state.

9. A system as claimed in claim 8 wherein said pair of spaced supporting members are oriented in a generally longitudinal relationship.

10. A system as claimed in claim 9 wherein each of said pair of spaced structural supporting members comprises a generally C-shaped channel members, with each of said generally C-shaped channel members being oriented in the same direction.

11. A system as claimed in claim 8 wherein each of said pair of spaced structural supporting members comprises a generally C-shaped channel members, said generally C-shaped channel members being oriented in a face to face relation.

12. A system as claimed in claim 10 wherein said generally C-shaped channel members each have an upper transverse oriented surface, and wherein said reinforcement member has a first end portion, and a second end portion opposite to said first end portion, said first and second portions each supported in part by a transverse surface of one of said pair of supporting members.

13. A system as claimed in claim 12 wherein said first and second end portions of said reinforcement member extend over each of said respective supporting members.

14. A system as claimed in claim 12 wherein said first and second end portions have hook portions having downwardly depending portions for assisting in securing said reinforcement member between said supporting members.

15. A system as claimed in claim 1 wherein said panel member is made at least in part from a foam plastic.

16. A system as claimed in claim 11 wherein said foam plastic is a foam polystyrene.

17. A system as claimed in claim 1 further comprising a sealing mechanism for forming a seal between said panel member and at said least one supporting member to retain said construction material when said construction material is in said unhardened state.

18. A system as claimed in claim 17 wherein said sealing device comprises a longitudinally extending resilient member, said resilient member being compressible between a first side surface of said panel member and said surface of one of said supporting members.

19. A system as claimed in claim 16 wherein said sealing device is a first sealing device and further comprising a second sealing device for forming a seal between a second side surface of said panel member and a surface of the other of said supporting members.

20. A system as claimed in claim 17 wherein a first side surface of said first panel member comprises an angled upper portion, said angled portion sloping downwards towards a surface of one of said supporting members and wherein said sealing device comprises an expandable foam injected between said angled portion of said first side surface and said surface of said one of said supporting members.

21. A system as claimed in claim 1 wherein said panel member comprises a plate member.

22. A system as claimed in claim 21 further comprising a bracket member secured to both said plate member and said reinforcement member, said bracket member

holding said reinforcement member in spaced relation to said upper surface of said plate member.

23. A system as claimed in claim 22 wherein said reinforcement member is a first
5 reinforcement member and said reinforcement unit further comprises a second
reinforcement member mounted to said panel member above said upper surface in
generally parallel relation to said first reinforcement member, said second
reinforcement member extending beyond said side surface of said panel member, and
wherein said bracket member holds said first and second reinforcement members in
10 spaced relation to said upper surface of said plate member.

24. A system as claimed in claim 5 wherein each of said at least one vertical rods
is secured to said reinforcement member at least in part in part with a connector.

15 25. A system as claimed in claim 1 wherein said construction material comprises
concrete.

26. A system as claimed in claim 1 wherein said at least one supporting member is
oriented generally longitudinally and said at least one supporting member comprises a
20 web portion having a transversely oriented aperture adapted for receiving ductwork
therethrough.

27. A system as claimed in claim 8 wherein each of said pair of supporting
member is oriented generally longitudinally and each of said pair of supporting
25 member comprises a web portion having a transversely oriented aperture adapted for
receiving conduits therethrough.

28. A system as claimed in claim 8 wherein each of said pair of supporting
member comprises a web portion having a transversely oriented aperture adapted for
30 receiving ductwork therethrough, the aperture of one of said pair of supporting
members being substantially in alignment with the aperture of another of said
supporting members.

29. A system as claimed in claim 1 wherein said portion of said reinforcement member is supported directly upon a surface of said at least one supporting member.
30. A system as claimed in claim 4 wherein said extension portion of said reinforcement member is supported directly upon a surface of said at least one supporting member.
31. A system as claimed in claim 30 wherein said extension portion of said reinforcement member is supported directly upon an upward facing surface of a transverse web portion of said at least one supporting member.
32. A system as claimed in claim 8 wherein each of said pair of spaced structural supporting members comprises a central generally vertically oriented web portion and a transverse web portion, each of said transverse web portions being oriented generally in the same direction.
33. A system as claimed in claim 8 wherein each of said pair of spaced structural supporting members comprises a central generally vertically oriented web portion and a transverse web portion, each of said transverse web portions being oriented toward each other in face to face relation.
34. A system as claimed in claim 16 wherein said upper and lower surfaces are laminated with a strength enhancing skin.
35. A system as claimed in claim 34 wherein said skin is made from polypropylene or polyethylene.
36. A system for fabricating a slab from a construction material having both hardened and hardened states, said system comprising:
- a) first and second form panel units, each said first and second form panel units comprising:

a panel member adapted for use as part of a form to retain said construction material when in an unhardened state, said panel member having generally opposed upper and lower surfaces;

at least one reinforcement unit each having at least one reinforcement member

5 mounted above said upper surface of said panel member;

b) first, second and third spaced structural supporting members adapted for assisting in supporting said slab made from said construction material;

10 said first form panel unit being configured such that said panel member of said first form panel unit is positioned between said first and second spaced structural supporting members, said reinforcement member of said reinforcement unit of said first form panel unit being supported at least in part by said first and second supporting members such that said panel member of said first form panel unit is
15 suspended from said first and second supporting members on said reinforcement member above said upper surface; and

said second form panel unit being configured such that said panel member of said second form panel unit can be positioned between said second and third spaced
20 structural supporting members, said reinforcement member being supported at least in part by said second and third supporting members such that said panel member of said second form panel unit is suspended from said second and third supporting members on said reinforcement member of said second reinforcement unit above said upper surface of said panel member of said second form panel unit;

25 and wherein said unhardened construction material can be retained above said panel members of said first and second form panel units between said first and third structural supporting members to permit hardening from said unhardened state to said hardened state of said construction material.

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37. A system as claimed in claim 36 wherein said panel members of said first and second form panel units are made from an insulating material.

38. A system as claimed in claim 37 wherein said insulating material is foam polystyrene.

39. A system as claimed in claim 37 wherein said panel members of said first and second form panel units fit between said first and second supporting members and said second and third supporting members, to provide for continuous insulation between said first and third supporting members.

40. A system as claimed in claim 38 wherein said panel members of said first and second form panel units fit between said first and second supporting members and said second and third supporting members, to provide for continuous insulation between said first and third supporting members.

41. A system as claimed in claim 39 wherein said wherein said first, second and third supporting members have a lower edge surface and said panel members of said first and second form panel units are suspended beneath said lower edge surfaces of said first, second and third supporting members each of said panel members of said first and second form panel units have an adjacent edge surface that engages the other to provide for continuous insulation between said first and third supporting members.

42. A system as claimed in claim 39 wherein said wherein said first, second and third supporting members have a lower edge surface and said panel members of said first and second form panel units are suspended beneath said lower edge surfaces of said first, second and third supporting members each of said panel members of said first and second form panel units have an adjacent edge surface that engages the other to provide for continuous insulation between said first and third supporting members.

43. A system as claimed in claim 36 further comprising a sealing mechanism for forming a seal between said second panel member and said first and second support members to retain said construction material when said construction material is in said unhardened state.

44. A system as claimed in claim 36 further comprising a sealing mechanism for forming a seal between said second panel member and said second and third support members to retain said construction material when said construction material is in said unhardened state.
45. A system as claimed in claim 36 wherein said reinforcement member of said first form panel unit overlaps above said second supporting member with said reinforcement member of said second form panel unit.
46. A structural slab comprising:
- a) a construction material;
 - b) a form panel unit comprising
 - i. a panel member having an upper surface and forming at least part of a form;
 - ii. at least one reinforcement unit having at least one reinforcement member mounted to said panel member above said upper surface of said panel member;
 - c) first and second spaced structural supporting members adapted to assist in supporting said slab made from said construction material;
- said panel member being suspended from said first and second supporting members on said reinforcement member, said construction material enveloping at least an upper portion of said supporting members and said reinforcement member.
47. A method for fabricating a slab from a construction material having both hardened and unhardened states using formwork system, said formwork system comprising:
- a) a form panel unit comprising

a panel member adapted for use as a form to retain said construction material in an unhardened state, said panel having generally opposed upper and lower surfaces;

5 at least one reinforcement unit each having at least one reinforcement member mounted to said panel member above said upper surface;

b) first and second structural supporting members adapted to assist in supporting said slab made from said construction material;

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said method comprising the steps of

(i) arranging the first and second structural support members in a spaced relation suitable for supporting said panel member;

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(ii) positioning said reinforcement unit such that said panel member is suspended from said first and second spaced structural supporting members, such that said unhardened construction material can be retained above said panel member to permit hardening from said unhardened state to said hardened state of said construction material, and such that said reinforcement member is supported at least in part by said supporting members and said panel member is suspended from said supporting members on said reinforcement member above said upper surface.

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48. A method as claimed in claim 47 wherein said reinforcement unit is positioned such that said supporting members have upper portions extending above said upper surface of said panel member; and further comprising the step (iii) wherein unhardened construction material is placed into said formwork above said upper surface of said panel so as to embed said upper portions of said supporting members in said construction material.

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49. A method as claimed in claim 48 wherein said first and second supporting members comprise members having transverse web portions oriented in the same

transverse direction, and wherein said step of positioning said reinforcement unit comprises:

- 5 (1) positioning a first side edge of said panel member beneath said transverse web portion with, at least in part, a transverse movement of said reinforcement unit;
- (2) pivoting said reinforcement unit downwards about a longitudinal axis located proximate said first side edge.

10 50. A method as claimed in claim 49 wherein, in positioning said first side edge of said panel member beneath said transverse web portion with, at least in part, a transverse movement of said reinforcement unit, said reinforcement member is supported upon said first supporting member.

15 51. A method as claimed in claim 50 wherein, having pivoted said reinforcement unit downwards about a longitudinal axis located proximate said first side edge, said reinforcement member is supported upon said second supporting member.

20 52. A system for fabricating a slab from a construction material having both unhardened and hardened states, said system comprising:

a) a form panel unit comprising

25 first and second panel members, each adapted for use as a form to retain said construction material when in a unhardened state, each said first and second panel members having generally opposed inner and outer surfaces, and opposed first and second side surfaces, said first and second panel members being arranged in spaced, generally aligned relation with the inner surface of said first panel arranged in face to face relation with the inner surface of said second panel;

30 ii. at least one reinforcement unit each having at least one reinforcement member mounted to both of said first and second panel member between said inner surfaces of said first and second panels, said reinforcement member extending beyond at least one of said first and second side surfaces of said first panel member;

b) a pair of spaced structural supporting members adapted for supporting said slab made from said construction material;

5 said form panel unit being configured such that said first panel member can be positioned between said spaced structural supporting members, such that said liquid construction material can be retained between said first and second panel members, between said structural supporting members to permit hardening from said liquid state to said hardened state of said construction material, said reinforcement member being
10 supported at least in part by said supporting members such that said first panel member is suspended from said supporting members on said reinforcement member.

53. A method for fabricating a slab from a construction material having both hardened and unhardened states using formwork system, said formwork system
15 comprising:

a) a form panel unit comprising

a panel member adapted for use as a form to retain said construction material when in
20 a liquid state, said panel having generally opposed upper and lower surfaces, and opposed first and second side surfaces;

at least one reinforcement unit each having at least one reinforcement member mounted to said panel member above said upper surface;

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b) first and second supporting members adapted to assist in supporting said slab made from said construction material;

said method comprising the steps of

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(1) arranging the first and second structural support members in a spaced relation suitable for receiving said panel member therebetween;

(2) suspending said panel member between said pair of supporting members on said reinforcement member, such that said panel member is located between said first and second spaced structural supporting members and said unhardened construction material can be retained above said panel member.

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54. A method as claimed in claim 53 wherein said reinforcement unit is positioned such that said supporting members have upper portions extending above said upper surface of said panel member; and further comprising the step (3) wherein unhardened construction material is placed into said formwork above said upper surface of said panel so as to embed said upper portions of said supporting members in said construction material.

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55. A formwork assembly for fabricating a slab from a construction material having both unhardened and hardened states, said assembly comprising:

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a) a form panel unit comprising:

a panel member having generally opposed upper and lower surfaces, said panel member being adapted to be used as part of a form to retain said construction material above said upper surface when in an unhardened state;

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ii. a reinforcement unit having at least one reinforcement member mounted above said upper surface of said panel member;

25 b) a pair of supporting members adapted for assisting in supporting said slab made from said construction material;

said panel member being suspended between said pair of supporting members on said reinforcement member, such that said unhardened construction material can be retained above said panel member.

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56. An assembly as claimed in claim 55 wherein at least one of said supporting members comprises a longitudinally extending upstanding web having a plurality

of apertures positioned such that unhardened construction material will flow into said apertures to provide an anchor for said at least one supporting members.

57. An assembly as claimed in claim 56 wherein each of said supporting members is a
5 generally inverted L-shape configuration.
58. An assembly as claimed in claim 57 wherein said supporting members are arranged
in a face-to-face configuration.
- 10 59. An assembly as claimed in claim 55 wherein at least one of said supporting
members has an aperture configured to receive an end portion of a reinforcement
member to support said reinforcement unit.
60. An assembly as claimed in claim 55 wherein each of said supporting members has
15 an aperture configured to receive therethrough a first and second end portion
respectively of a reinforcement member to support said reinforcement unit at both
said first and second end portions of said reinforcement member.
61. An assembly as claimed in claim 60 wherein said apertures in each of said
20 supporting members comprises a notched portion at a lower edge of said
upstanding web, and wherein each of said first and second end portions are
received through said notched portions of said web.
62. An assembly as claimed in claim 61 wherein said notched portions have a
25 longitudinally extending portion for supporting said first and second end portions
thereon.
63. An assembly as claimed in claim 62 wherein said first and second end portions
have vertical hooked portions to assist in retaining said reinforcement member in
30 said apertures.

64. An assembly as claimed in claim 62 wherein said first and second end portions have vertical hooked portions which extend upwards toward an upper portion of said web of said supporting members.

5 65. An assembly as claimed in claim 55 wherein each of said supporting members comprises a longitudinally extending upstanding web having an upper edge to receive thereover one of a first and second end portion respectively of said reinforcement member to support said reinforcement unit at both said first and second end portions of said reinforcement member.

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66. An assembly as claimed in claim 65 wherein said first and second end portions have vertical hooked portions to assist in retaining said reinforcement member in said apertures.

15 67. An assembly as claimed in claim 66 wherein said hooked portions extend downward toward a lower portion of said web.

68. An assembly as claimed in claim 67 wherein said hooked portions exert inwardly directed compressive forces against said web to assist in securing said
20 reinforcement unit on said supporting members.

69. A structural elongated support member for use in supporting a concrete slab, said support member having an upstanding web having an upper elongated web portion, said upper web portion having a plurality of spaced apertures disposed along said
25 elongated upper web portion.

70. A member as claimed in claim 69 wherein said upper web portion is oriented at an angle approximately 90 degrees to a remaining medial portion of said web.

30 71. A member as claimed in claim 69 wherein said support member has a pair of joined, upstanding webs configured in a generally U-shaped configuration, each upstanding web having an upper elongated web portion, said upper web portions

having a plurality of spaced apertures disposed along said elongated upper web portion.